# Electron trigger for p+p

## Y. Akiba (KEK)

# Electron trigger for p+p

- I propose to have electron trigger for the p+p run
  - EMCAL*RICH with EMCAL 2x2 threhold at 300 MeV
- This is almost ideal, little bias trigger for *ANY* electron measurement of interest
  - J/Psi $\rightarrow$ ee
  - $\phi$, $\rho$, $\omega$ $\rightarrow$ ee
  - c $\rightarrow$ eX
- The low threshold (300MeV) can also be used as "minimum activity trigger" in the central arms.
- The expected rejection rate (200-300) is sufficient for this year's luminosity
- This trigger is required to detect/reconstruct D meson in this year
  - Tag "charm" event by single electron
  - With this trigger, expected yield is about 300 $D^0 \rightarrow K\pi$ per 1/pb
  - If the threshold is raised to 0.9 GeV, the yield will be down by factor of 10. This is because electron acceptance is decreased from 50% to 5%.

# Effect to the high pt charged

| Yield assume 500/nb of total integrated luminosity | | | | | |
|---|---|---|---|---|---|
| Pt | ds(mb) | Yield | MB | 4x4 2GeV | |
| 2.0-3.0 | 0.15 | 5.3E+07 | 5.5E+05 | 0 | |
| 3.0-4.0 | 1.50E-02 | 5.3E+06 | 5.5E+04 | 1.2E+06 | |
| 4.0-5.0 | 2.30E-03 | 8.1E+05 | 8.5E+03 | 2.5E+05 | |
| 5.0-6.0 | 4.50E-04 | 1.6E+05 | 1.7E+03 | 5.8E+04 | |
| | | | | | |
| | | | | | |
| Guestimate of 4x4 2 GeV efficiency | | | | | |
| | | | | | |
| 2.0-3.0 | very small | | | | |
| 3.0-4.0 | 23% | | | | |
| 4.0-5.0 | 31% | | | | |
| 5.0-6.0 | 37% | | | | |
| | | | | | |
| | | | | | |

- With 2 GeV threshold for 4x4, pt=2.0-3.0GeV/c bin is hard to trigger. However, little spin asymmetry is expected at this pt bin.
- For high pt bin, 4x4 should have reasonable efficiency (20 to 40%).
- The efficiency is guesstimated as $0.6*(<E>-2GeV)/<E>$
- The originally proposed trigger also do not have good efficiency, either. It may have even worse efficiency for some pt bins because of a large leakage of hadronic energy outside of the trigger tile.